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APPARATUS FOR MEASURING CIRCUMFERENCES
[APPAREIL POUR MESURER DES CIRCONFÉRENCES]

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The present invention concerns an apparatus permitting measurement of circumferences of objects such as tanks having circular, elliptical, or other shapes.

The apparatus consists of a chassis supporting an opisometer, the wheel of which is intended to stay in contact with the surface of the object the circumference of which is to be measured, this chassis including means for guiding it against this object. Thus an extremely simple apparatus capable of being used for all sorts of objects is obtained.

According to a specific design characteristic, the chassis has the shape of a stirrup, between the branches of which the opisometer is located, a support comprising a first friction roller mounted loosely on a shaft located approximately parallel to the shaft of the opisometer wheel and intended to stay in contact with the surface of the object, the circumference of which is to be measured, and a second friction roller mounted loosely on a shaft approximately perpendicular to the shaft of the first friction roller and intended to stay in contact with an edge of the object, being articulated on the free end of each branch.

This arrangement assures that the apparatus can be moved with respect to a reference edge consisting of the edge of the object and that the measurement will be correct.

*Numbers in the margin indicate pagination in the foreign text.

Given that the supports are articulated on the branches of the stirrup, the apparatus according to the invention permits not only measuring the external circumferences of an object, but also the internal circumferences.

According to another design characteristic, the apparatus can comprise means for locking the supports on the free ends of the respective branches of the stirrup in appropriate angular positions.

Preferably, the stirrup branches are crossed by bolts constituting axes of articulation for the supports and receiving locking nuts.

According to one embodiment, the supports can be articulated on the branches of the stirrup with interposition of elastic means intended to bring them close to one another.

Because of this kind of assembly, the apparatus according to the /2 invention can also be used directly and without any adjustment for measuring internal circumferences as well as external circumferences of objects.

The invention will now be described with more details by /3 referring to a specific embodiment given only as an example and shown in the appended drawings. In these drawings:

Fig. 1 is a perspective view of an apparatus according to the invention,

Fig. 2 schematically shows the use of the apparatus according to the invention in a side view,

Fig. 3 is a top view showing a detail of a version of an embodiment of the invention.

The apparatus shown in the figures comprises a chassis 1 having the shape of a stirrup and having a base 4 and two branches 5 and 6.

A plate 7 that supports the opisometer 2 provided with a wheel 3 is attached to the branches 5 and 6.

The opisometer is of a classic type having a dial 8 with a display needle and a resetting button 9.

Branch 5 of the stirrup is crossed by a bolt that constitutes an axis of articulation for a support 10, the bolt receiving a nut 11.

Support 10 comprises a friction roller 13 mounted on its shaft and placed so as to extend in approximately the same plane as the wheel 3.

A threaded rod that crosses an elongated opening 14 of a bar 15 supporting, on its free end, a friction roller 16, turning loosely on its axis, this bar being attached by a nut 17, screwed on the this threaded rod, extends on the support 10.

The axis of the friction roller 16 extends approximately perpendicular to the axis of the friction roller 13.

A support 20 of the same type as support 10 and comprising a first friction roller 21 located in the plane of the friction roller and the wheel 3, and a second friction roller 22 held by a bar 23 attached by means of a bolt and a nut 24 on this support 20, is articulated on branch 6 on a bolt having a nut 19. Plate 7 is

provided with a scale **12** for facilitating location of a reference joint on the object, the circumference of which is to be measured.

When it is desired to measure the external circumference of an /4 object, bolts **11** and **19** are loosened in order to adjust the angular positions of supports **10** and **20** so that, on the one hand, friction rollers **13** and **21** bear against the lateral surface of said object and that wheel **3** is in contact with said lateral surface, then nuts **11** and **19** are tightened and the angular position of bars **15** and **23** is adjusted so that friction rollers **16** and **22** can roll perfectly on the edge of this object and these bars are locked by tightening nuts **17** and **24**, then, starting from a specific point, the apparatus is moved all around the object up to this point. Thus the desired measurement automatically displayed on the opisometer dial is obtained.

It is also possible to measure the internal circumference by proceeding in the same way and adjusting the positions of supports **10** and **20** and friction rollers **16** and **22**.

Fig. 3 shows a version of an embodiment of the invention, which is more particularly intended to be used with objects the circumference of which is to be measured, these objects having an irregular curvature.

Reference number **1a** designates the entire chassis, which is not shown in detail here. A shaft **25**, on which one of the ends of a spiral spring **27** is mounted, the other end of which spring is hooked to the edge of support **20a**, is attached to branch **6a** of the chassis;

therefore the support tends to tilt in the direction of the arrow f. Support **20a** is identical to support **20** and, consequently, has a first friction roller **21a** and a second friction roller **22a** held by an adjustable bar **23a**.

This figure does not show the second support, which is mounted in the same way on support **20a**.

At the time of taking measurements, the spiral springs **27** of the two supports always tend to keep the corresponding first friction rollers in contact with the internal or external lateral surface of the object to be measured, and thus it is possible to measure the circumference of objects having irregular curvatures.

Of course, the invention is not limited to the embodiment which /5 has just been described and shown, numerous modifications of details can be made to it without thus departing from the framework of the invention.

CLAIMS

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1. An apparatus for measuring circumferences of objects such as tanks, wherein it comprises a chassis (1) supporting an opisometer (2), the wheel (3) of which is intended to stay in contact with the surface of the object, the circumference of which is to be measured, this chassis (1) including means for guiding it against this object.

2. The apparatus according to Claim 1, wherein the chassis (1) has the shape of a stirrup, between the branches (5, 6) of which the opisometer (2) is located, a support (10, 20) comprising a first friction roller (13, 21) mounted loosely, and the axis of which

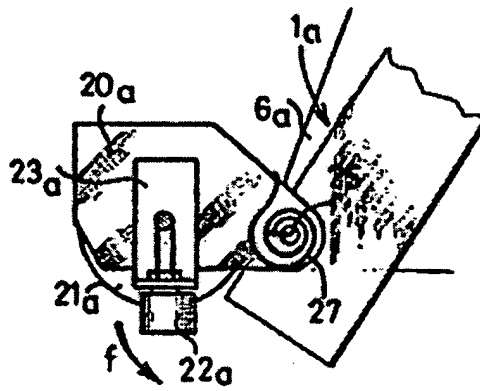
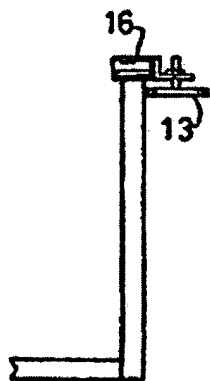
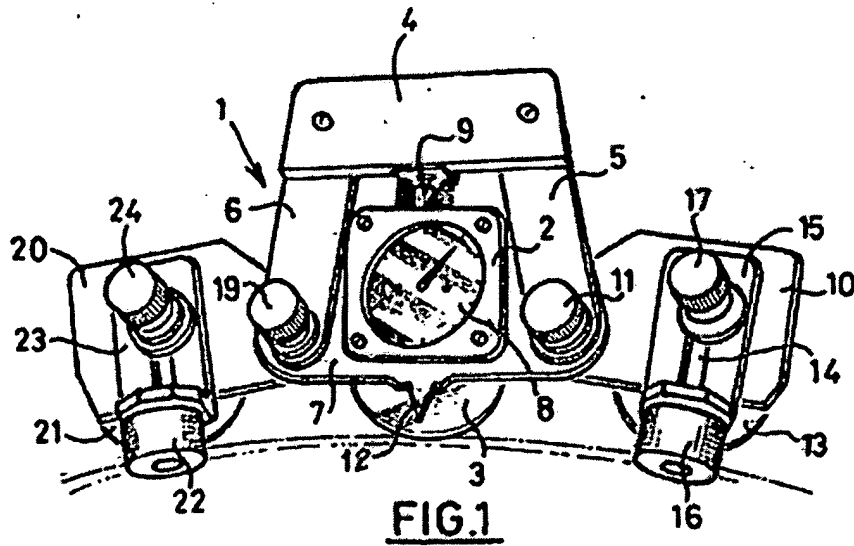
friction roller is located parallel to the axis of the opisometer (2) wheel (3) and intended to stay in contact with the surface of the object, the circumference of which is to be measured, and a second friction roller (16, 22) mounted loosely on a shaft approximately perpendicular to the shaft of the first friction roller and intended to stay in contact with an edge of the object, being articulated on the free end of each branch.

3. The apparatus according to Claims 1 and 2, wherein it comprises means (11, 19) for locking the supports (10, 20) on the free ends of the respective branches of the stirrup (1) in appropriate angular positions.

4. The apparatus according to Claim 3, wherein the stirrup branches are crossed by bolts constituting axes of articulation for the supports and receiving locking nuts (11, 19).

5. The apparatus according to Claims 1 and 2, wherein the supports (20a) are articulated on the stirrup branches with interposition of elastic means (27) tending to bring them close to one another.

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